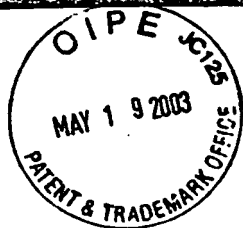


EXHIBIT 3



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Hawley's Condensed Chemical Dictionary

ELEVENTH EDITION

Revised by

N. Irving Sax
and

Richard J. Lewis, Sr.

1987



VAN NOSTRAND REINHOLD COMPANY

New York

transition element. (transition metal). Any of a number of elements in which the filling of the outermost shell to eight electrons within a period is interrupted to bring the penultimate shell from 8 to 18 or 32 electrons. Only these elements can use penultimate shell orbitals as well as outermost shell orbitals in bonding. All other elements, called "major group" elements, can use only outermost shell orbitals in bonding. Transition elements include elements 21 through 29 (scandium through copper), 39 through 47 (yttrium through silver), 57 through 79 (lanthanum through gold), and all known elements from 89 (actinium) on. All are metals. Many are noted for exhibiting a variety of oxidation states and forming numerous complex ions as well as possessing extremely valuable properties in the metallic state.

See also orbital theory. (R. T. Sanderson).

transmutation. The natural or artificial transformation of atoms of one element into atoms of a different element as the result of a nuclear reaction. The reaction may be one in which two nuclei interact, as in the formation of oxygen from nitrogen and helium nuclei (beta particles), or one in which a nucleus reacts with an elementary particle such as a neutron or a proton. Thus a sodium atom and a proton form a magnesium atom. Radioactive decay, e.g., of uranium can be regarded as a type of transmutation. The first transmutation was performed by the English physicist Rutherford in 1919.

transportation label. See label (1).

transuranic element. An element of higher atomic number than uranium, not found naturally, and produced by nuclear bombardment. The most recently discovered are 105 and 106, although there is as yet no confirmation. They are all radioactive.

See actinide, Periodic Table.

Traube purine synthesis. Preparation of an appropriate 4,5-diaminopyrimidine by introduction of the amino group into the 5-position of 4-amino-6-hydroxy- or 4,6-diaminopyrimidines by nitrosation and ammonium sulfide reduction, followed by ring closure with formic acid or chlorocarbonic ester.

tremolite. CAS: 1332-21-4. $\text{Ca}_2\text{Mg}_5\text{Si}_8(\text{OH})_2$. A variety of asbestos. Some tremolite is sold as "fibrous talc."

Properties: Color white to light green, luster vitreous to silky, hardness 5-6, d 3.0-3.3, resistant to acids. Noncombustible.

Occurrence: New York, California, Maryland, South Africa.

Hazard: Inhalation of dust or fine particles is dangerous. Carcinogenic.

Use: As asbestos, particularly in acid-resisting applications, ceramics, paint.

"Treopax."³³⁷ TM for 90% minimum purity form of zirconium oxide. Contains 5% max silicon dioxide, mp 2480C.

Use: Source for zirconium oxide for welding rod coatings and to stabilize color in titanium enamels.

tretamine. Generic name for 2,4,6-tris(1-aziridinyl)-s-triazine.

See under triethylenemelamine.

"Trevira 271."⁵⁸⁹ TM for a durable flame retardant fiber in which the retarding agent is a constituent of the polymer structure and thus is impossible to remove by laundering or dry-cleaning. The polymer used is polyethylene terephthalate; the nature of the retardant has not been disclosed. The fiber is stated to be self-extinguishing and will melt when subjected to a direct flame. It is intended for use primarily in children's sleepwear.

triacetate fiber. See acetate fiber.

triacetin. (glyceryl triacetate).

CAS: 102-76-1. $\text{C}_9\text{H}_{18}\text{O}_6$.

Properties: Colorless liquid with slight fatty odor and a bitter taste, d 1.160 (20C), bp 258-260C, sets to a glass -37C, refr index 1.4312 (20C), flash p 300F (149C), bulk d 9.7 lbs/gal. Slightly soluble in water; very soluble in alcohol, ether, and other organic solvents. Combustible.

Derivation: Action of acetic acid on glycerol.

Method of purification: Vacuum distillation.

Grade: Technical, CP, ND, FCC.

Use: Plasticizer, fixative in perfumery, manufacture of cosmetics, specialty solvent, to remove carbon dioxide from natural gas, medicine (topical antifungal).

triacontanoic acid. See melissic acid.

1-triacontanol. CAS: 593-50-0.

$\text{CH}_3(\text{CH}_2)_{28}\text{CH}_2\text{OH}$. A 30-carbon, straight-chain fatty alcohol.

Properties: Colorless needles from ether, mp 85-88C, soluble in most organic solvents, insoluble in water, d at mp 0.777. Combustible.

Occurrence: Beeswax, carnauba wax, leaf wax.

Use: Biochemical research, growth promoter, fertilizer supplement.

"Triafil."⁴⁷⁰ TM for electric insulating film based on cellulose triacetate.